Authors: V. Briesemeister, E. Belarbi, S. Weiss – Robert Koch Institute (RKI), Berlin, Germany
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Concept and general remarks for the training material for SARS-CoV-2 PCR diagnostic

This document was originally produced for participants of the training provided by RKI for SARS-CoV-2 PCR diagnostic in April 2020. Because of worldwide current travel restrictions, the training was held remotely. All documents are produced in a way to allow experienced users to independently work their way through it.

Target audience, aims and learning objectives

The main objective of this programme is to train participants in performing SARS-CoV-2 diagnostics using the material mentioned below and described in the respective SOPs. The target audience are users with experience in working with infectious agents and qPCR.

Specific training objectives are:

- Understand the principles of column based nucleic acid extractions
- Be able to conduct nucleic acid extractions using commercial column-based systems
- Know the necessity to have designated working areas for different steps
- Understand the concept of reverse transcriptase quantitative PCR (RT-qPCR)
- Be able to conduct molecular diagnostics for SARS-CoV-2 using the assays described and provided within this training package.

Materials used in this training

item	Cat-No.
TIB Molbiol LightMix® SarbecoV E-gene plus EAV control	40-0776-96
TIB Molbiol LightMix® Modular SARS-CoV-2 RdRP-gene	53-0777-96
TIB Molbiol 1-step RT-Polymerase Mix	90-999-96
QIAamp Viral RNA Mini Kit	52904 (50 rxn) 52906 (250 rxn)

Documents and video clips provided

INFO_Nucleic_Acid_extraction_en.pdf
INFO_Polymerase_Chain_Reaction_Introduction_en.pdf
SOP_inactivation-extraction_Qiagen_en.pdf
SOP_nCoV_TIB_PCR_***version***_en.pdf
SARS-CoV-2_PCR_template_***version***.xlsx
FAQ.pdf

The INFO files contain background information on the different topics and can be applied to different scenarios. You can find a moderated version of the files when downloading the file:

webinar.mp4

The SOP files are tailored towards the kits distributed during the training and can be used as working instructions when using the kits mentioned above. However, always check for plausibility by referring to the manufacturer's instructions for use. Specifically, as there are currently two versions of the SOP for the PCR circulating. Please make sure you are using the correct version depending on the kit you have received:

_version_1.x for the 5x concentrated RT-qPCR Mix
_version_2.x for the 2x concentrated RT-qPCR Enzyme Mix

Documents are accompanied with short movie clips illustrating the procedures (download movies to watch):

M101_Preparation_extraction_reagents_en.mp4
M102_Nucleic_acid_extraction_process_en.mp4
M201_Preparation_of_PCR_reagents_en.mp4
M202_Preparation_of_positive_control_en.mp4
M203_Preparation_of_PCR_en.mp4

How to use the training material

1) Go through the INFO slides or watch the webinar video for an overview on the procedures
2) Refer to additional material, if needed
3) Work through the SOPs provided – be sure you are using the correct version!
4) Run the workflow on controls or known samples
5) Critically evaluate your results
6) Refer to the FAQs for any additional questions.

Biosafety and Biosecurity

Within the scope of this training the authors cannot provide comprehensive guidance on biosafety and biosecurity. Before conducting diagnostics within this training, please make sure your laboratory is appropriately equipped and fit for this purpose, and lab personnel are adequately qualified.

Please also refer to the WHO interim guidance for laboratory biosafety when working with samples potentially containing Coronavirus. You find the current document (as found online on 9 April 2020) on your USB key, but always check for latest version online: https://www.who.int/publications-detail/laboratory-biosafety-guidance-related-to-coronavirus-disease-2019-(covid-19)

WHO has also published a video series on biosafety that you can find online following this link:
https://www.who.int/ihr/publications/biosafety-video-series/en/

Recommendations on good laboratory practise

- Clean your workspace before and after starting
- Wear appropriate gowns and personal protective equipment (PPE)
- Organise your workspace according to your workflow
- Prepare working aliquots of your reagents. This will allow you to discard them in case of suspected contamination
- Use a template and pipetting scheme for your PCR, specifically when using 96 well plates.
- Use templates on your PCR machine

Disclaimer

The authors made every effort to provide accurate information. Nevertheless, mistakes may occur. The authors do not assume liability for relevance, accuracy and completeness of the information provided.